Spring 1994

The Computer Museum NEWS

"Many people think virtual reality is like being taken for a motorcycle ride. But in this virtual world, you are in command."

—Edith Ackerman, MIT Media Laboratory

Members Only
Saturdays: May-June
10:30AM-12:30PM

Is Virtual Reality a Learning Tool? *See For Yourself*

Virtual world programmed on a 486 50MHz PC, donated by Digital Equipment Corporation, with WorldToolKit Virtual Reality Development software from Sense8, and a Beachtron Three-D audio card from Crystal River Engineering.

Museum visitors can explore the microscopic world of cell biology, using virtual reality (VR) technology, April 9-June 30, 1994. From 2-5pm daily, visitors can don a head-mounted display and enter a virtual world to build a human cell, blown up millions of times life size. During school vacation week, April 16-24, the virtual world will be open 10:30am-12:30pm and 2-5pm.

Tickets for the head-mounted display, which are limited, are free to members and available to the public at $3.00/person first-come, first-serve, starting at 10am, for that day only. Non-ticketed visitors can watch live demonstrations and view the virtual world on a large monitor nearby.

With partial support from the National Science Foundation, the Museum has been carrying out research on the effectiveness of virtual reality as a tool for informal learning. "While much has been written on the educational potential of VR, little research has been done on it as a tool in informal science education," said Hyman H. Field of the National Science Foundation. An NSF Small Grant for Exploratory Research has enabled the Museum to test if visitors' understanding of the human cell is improved by "walking into" this basic biological building block and studying it in an interactive, three-dimensional virtual environment versus two-dimensional graphics.

For testing, VR was defined as having three qualities: 1) It is fully interactive, i.e., objects in the world react to your interaction with them; 2) you move and interact with it naturally using sensors tracking your head and hand movements; 3) the world is immersive via a head-mounted display using goggles and headphones.

An Inaccessible World Opens

Visitors can use a hand-tracker to manipulate objects in the virtual world. Touching a (computer-generated) girl's head, arm or stomach, the visitor is flown inside a room containing an empty six-foot neuron, muscle or intestinal cell. The cell is surrounded by organelles (the different elements of a cell), explained with animations and sound effects. When visitors place the right organelles in the cell, an animation shows the cell in action.

"This immersive environment is the most interesting I've ever seen," said Edith Ackerman, a study advisor, who designs learning environments with Seymour Papert. "In addition to exploring an inaccessible world, as you build the cell, it responds. That's powerful."

"The challenge was to build a world that wasn't a shooting game, but was educational and gripping," said project co-investigators David Greschler and Eben Gay. To make the cell more accessible and alive, three-D sound effects are used.

Pilot research showed that while visitors found it exciting to enter a virtual world and move things around, they often became so involved with the novelty of the interaction, they lost track of learning about the cell. "I felt as if I were in another place and time," said a Boston University student. "When I took off the helmet, I half expected the objects to be there," agreed graphic artist Chuck Eichten. "I see the educational potential, but the technology is still so clumsy that I missed the point. You have to think too much about moving around."

Bridge to Learning

What engaged visitors most was how real the micro-world seemed. Having a cell to build, they wanted to stay there and take control. "VR could be a wonderful bridge to learning for young people," noted one visitor. Almost all the teenagers in the pilot survey said they would like to use VR in their classes.

Using the pilot results, the Museum enhanced the system, adding a "VR tutorial" to familiarize visitors with the technology, sound effects and visual cues to make the world more responsive, and audio explaining the activity and cell structure.

Formal testing involved a random sample of 600 visitors, interviewed before and after the half-hour experiment about their understanding of the cell and their enthusiasm for cell biology. One-third explored the world in a fully interactive way with head-mounted display and sensors; one-third engaged the world using a joystick to move about a two-dimensional screen; one-third watched a video on a big screen without control over the presentation. The Museum is assessing the differences in learning among the groups. For the results—available this summer—e-mail ***computer_info@tcm.org*** with ***request*** in the subject line and ***send help instructions*** as the body of the message.

Museum Brings Auction

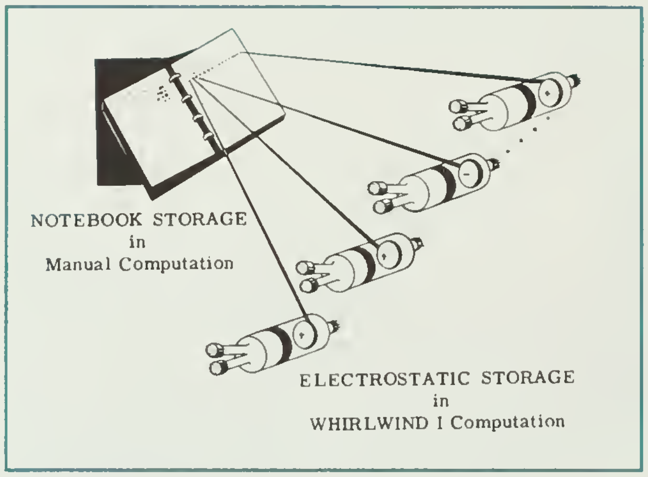
In a high-tech twist on the charity auction, The Computer Museum is hosting "The First Internet Auction" April 22-29, 1994, to support its educational programs. The Auction, the first of its kind, will be conducted entirely through electronic mail on the Internet using software created and donated by Enterprise Integration Technologies (EIT). Appropriately, many of the items up for bid are vintage components or documents of technologies from which the Internet ultimately evolved.

The Computer Museum First Internet Auction is open to anyone who sends e-mail to: "***auction-info@auction.tcm.org***". A computer server functions as the "auctioneer," and anyone who submits a bid becomes a participant. People who want to bid but do not have e-mail can call (617)426-2800 x322 or e-mail from a terminal in The Computer Museum Store from 10am to 5pm daily.

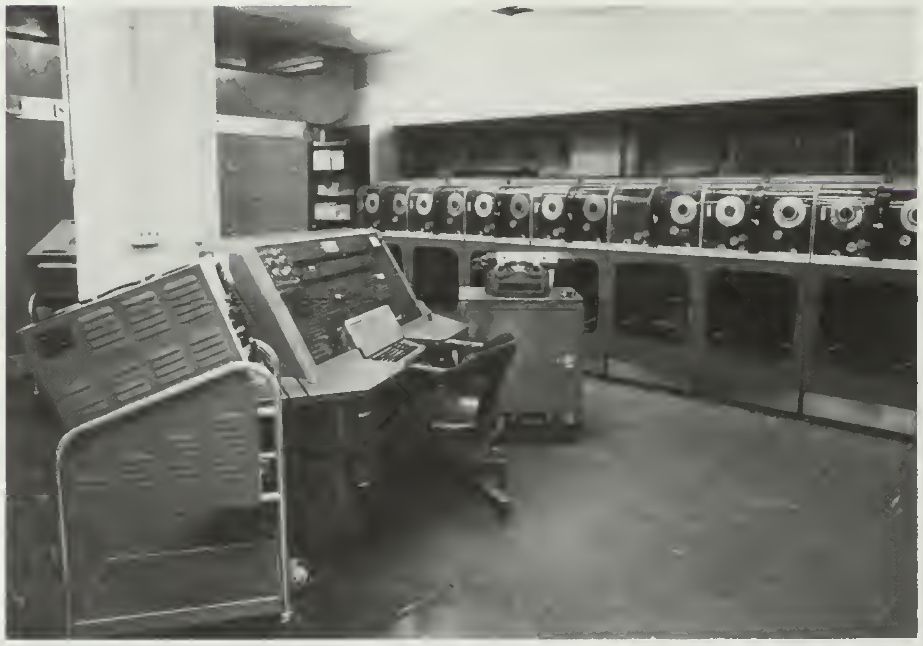
Over 60 items include early computing memorabilia and a unique assortment of goods and services donated by industry leaders. Bidding for the most affordable items, such as Cardiac, a cardboard computer developed at Bell Labs, begins at $5.00. The most expensive item is an Ethernet Sniffer™ network analyzer (worth $10,000) from Smart Valley's Harry Saal and the Network General Corporation, which starts at $3,000.

For computing entertainment, highlights include the opportunity to have an evening playing Space Wars, the "mother" of all computer games, on a 1962 PDP-1 at The Computer Museum. For the highest bidder, Microsoft Chairman Bill Gates is providing the entertainment selection he'd want with him if stranded on a desert island (with electricity). Miller Communications is offering PR wizard Fred Hoar's services as toastmaster or ghostwriter. Plus, a panoply of entertainment tickets and other services are up for bid.

For computer history and nostalgia buffs, the Auction has over 25 items: original material from MIT's 1952 Whirlwind computer and, from the other end of Cambridge, a Harvard Mark I "package" including a tour of the computer at the Croft Computation Laboratory. The Auction also offers collectors rare product manuals and books, many signed by their authors or key industry figures. The selection includes a collection of essays by and about Albert Einstein, signed by himself, and a first edition of *Cybernetics*, signed by Norbert Wiener.



This illustration is from an original Whirlwind I manual featured in the Auction.



Official U.S. Air Force Photo

The Auction features original 1950s' manuals that explain how to program the UNIVAC I (seen above).

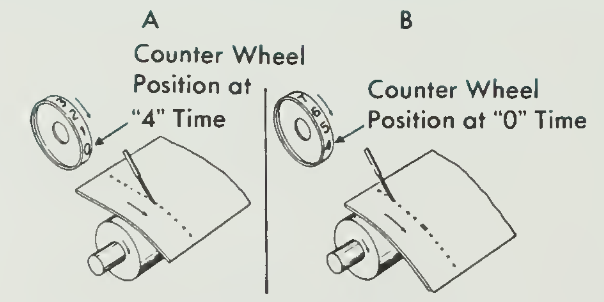
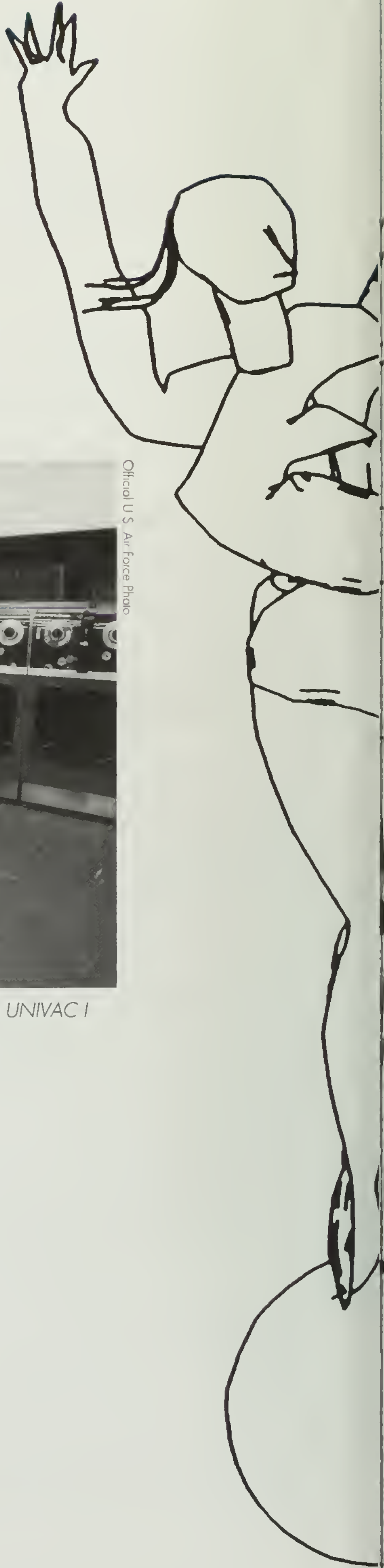


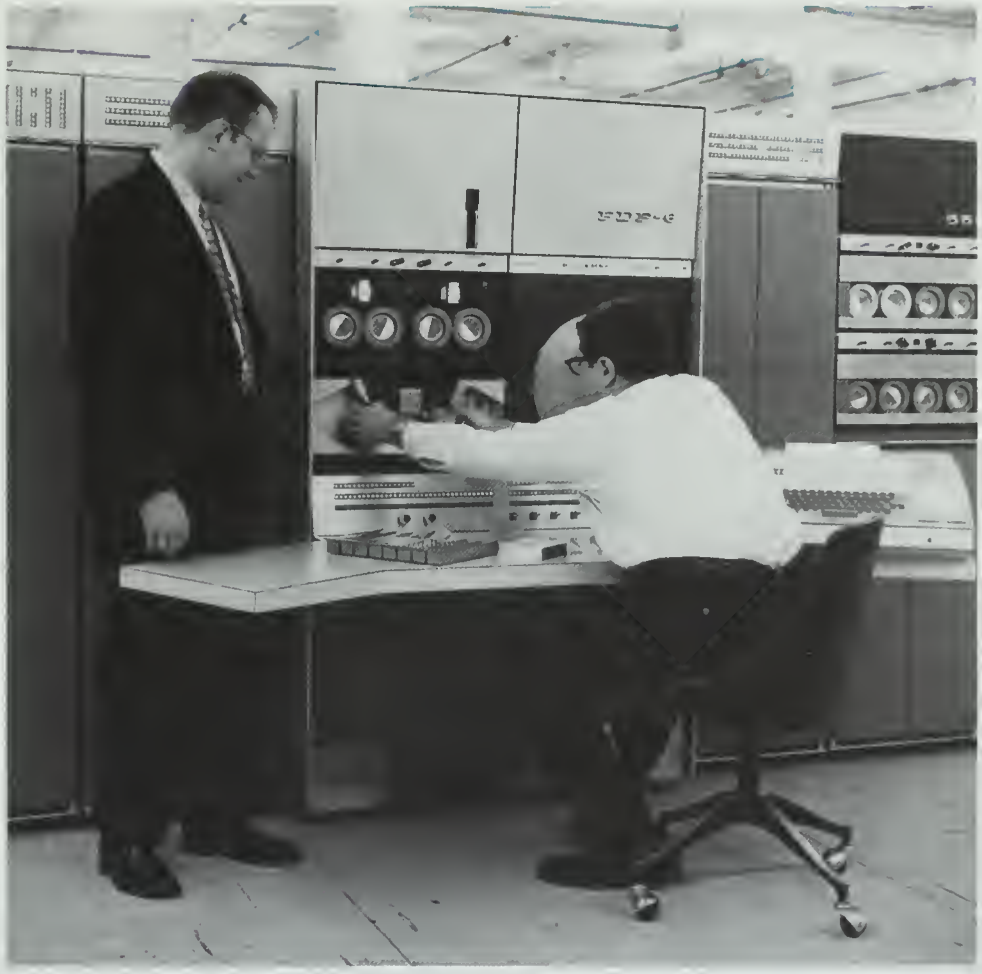
FIGURE 225. MOVEMENT OF COUNTER WHEEL IN ADDITION

This illustration is from a classic 1960 IBM Reference Manual, which—along with the actual brushed aluminum plugboard and patch cords—is up for bid.



Block To Cyberspace In

The 1st Internet Auction



Computer engineer Gordon Bell (seen above in 1966 with fellow engineer Alan Kotok at a PDP-6) has donated an autographed copy of his Computer Engineering. A DEC View of Hardware Systems Design *(1978), along with rare modules from the PDP-1, 4 6, 8, and 11. Starts at $50.00.*

The drawing is from Aaron's Code: Art, Artificial Intelligence and the Work of Harold Cohen *(1991), donated by author Pamela McCorduck and signed by her and Cohen. The bidder also receives an original Cohen print and two invitations to the premier showing of his painting robot machine. Starts at $175.00.*

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How It Works

To bid, send an e-mail at any time to: "*auction-info@auction.tcm.org*". Instructions and a registration form are returned promptly via e-mail. When you return the completed registration form via e-mail, a confirmation and list of Auction items are automatically forwarded. (Participants who wish to remain anonymous may choose a "handle.")

Bidding begins on April 22 at 10am, EST. The Auction continues 24-hours-a-day until the last items close April 29 at 8pm, EST. The server "auctioneer" processes bids according to arrival time and returns e-mail messages as bids are accepted or superceded. Every day, starting April 25, some items close. When time is almost up on an item, the "auctioneer" automatically reminds the three top bidders.

On Monday, April 25, the first set of items closes including a hardbound UNIVAC I manual with a module made by the Eckert Mauchly Computer Corporation. On Tuesday, another batch closes with the highest bidder getting a rare Gortex jacket distributed to the Lisa development team, that bears the inscription "thinker, stargazer..." On Wednesday, Apple Computer Vice President and Chief Scientist Larry Tesler's thoroughly autographed copy of a 1970s Mid-peninsula Free University catalog, complete with a drop of General Magic President Marc Porat's blood, can find its way to a new owner. Then, on Thursday, another dozen items close, and the winner may receive an original Intel 4004 chip mask, signed by Ted Hoff, one of the chip's inventors, and suitable to display as art. Finally, Friday, the last 25 items may bring the Internet to a screeching halt if all the "techno-geeks" dial up at the last minute in hot pursuit of the rarities available.

Enterprise Integration Technologies, Palo Alto, California, has developed and donated the software for the Auction. The Auction is implemented using EIT's ServiceMail toolkit. EIT is a contract R&D and commercial consulting practice that develops software and services to help companies do business on the Internet.

For more information, e-mail "*auction-info@auction.tcm.org*" or call (415)323-1909 or (617)426-2800 x322. For information about EIT, e-mail: "info@eit.com".

Up and Running

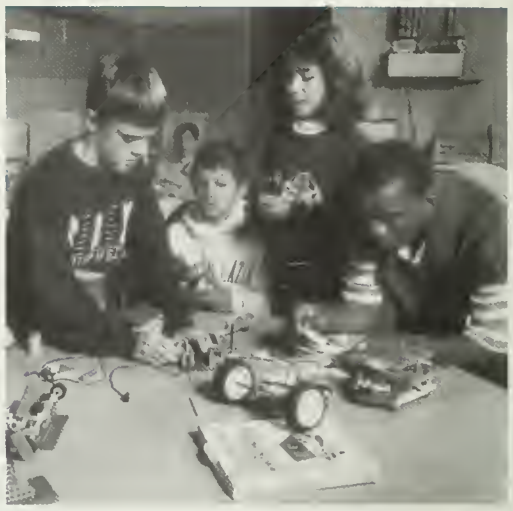
Launched

The Computer Clubhouse is for Boston's underserved youth, age 10 to 16, to develop skills by applying the latest computer technology to their own projects. Young people work together with a committed group of mentors—students and professionals in art, music, engineering, education and other fields.

One high school student has developed an interactive multimedia essay about Native Americans for an independent study project. A graduate student in engineering and three seventh graders are building a computer-controlled robotic interface for a science fair. Five high school students and a graphics designer are developing a computer-based "art" project.

The Clubhouse is open for drop-in visits by individuals Tuesday-Friday 2pm-5pm and Saturday 10am-4pm.

Interested in becoming a member or mentor? Call Clubhouse Program Manager Sam Christy (617)426-2800 x347 or e-mail "christy@tcm.org". For information on mentors, call Noah Southall (617)426-2800 x374 or e-mail "southall@tcm.org".



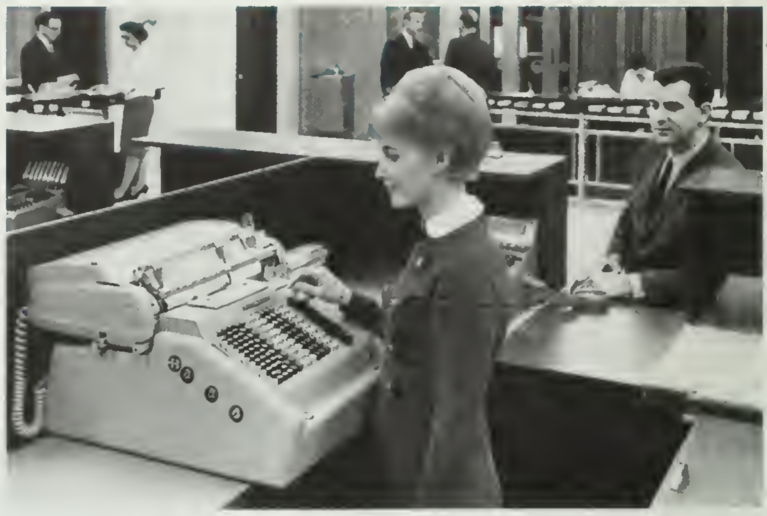
Photograph: Keith Quenzel/FAYFOTO

Young people from Dorchester, Mass., create computer-controlled LEGO devices in the Clubhouse.

Collections

Volunteers Make a Difference

Two volunteers have helped the Collections Department move ahead on two big projects. John Campbell, a consultant and former MITRE Corporation employee, has been sorting and cataloging some of the more arcane documentation donated to the Museum over the years, as well as working to identify and list posters, journals, and programs on paper tape. Simson Garfinkel, an artificial intelligence researcher and author of books and articles on subjects ranging from AI and UNIX to contemporary Japan, has developed a demonstration module for a new image database of the Museum's photograph collection. The demo shows how, once Simson has catalogued and digitized the entire collection of over 4,000 photos, a researcher—or a curious Museum visitor—will be able to search the database for individual images or groups of images relating to specific subjects or to more general themes.



Photograph: The Computer Museum

Currently catalogued only as a photograph of a Burroughs disk file system terminal, this image of an early remote banking terminal will be digitized and listed under both manufacturer and model name and under keywords like telecommunications and banking.

Special Programs

Even Computers Go To Sleep

So discover the children of all ages who pile into The Walk-Through Computer™, sleeping bags and pillows in tow, as part of The Computer Museum's new Overnights Program. Directed by Eileen Knight, the Museum's Manager of Special Services, this innovative program lets kids explore the Museum, participate in a wide range of exciting games and educational activities, make new friends and spend the night camped out in our galleries.

"Our kids get a chance to learn in a playful way how computers work and to explore imaginative applications that might not be available at home or school," said Larry Ockene, who recently brought a Newton, Mass., Futurekids group to the Museum. "Overnights are a great programming alternative for group organizers," said Knight. "Kids love spending an entire night in a museum."

For more information, please call us at 1-800-370-CHIP.

Photograph: Eileen Knight

Some Futurekids catch 40 winks inside The Walk-Through Computer™.

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We apologize for any inadvertent omissions from our donor list. Please inform us of any errors so that we may correct our records.

Upcoming Events

VIRTUAL REALITY

Saturday, April 9-Thursday, June 30, 1994: 2-5pm

School vacation week:
Saturday, April 16-Sunday, April 24, 1994:
10:30am-12:30pm & 2-5pm

Members Only:
Saturdays: May-June: 10:30am-12:30pm

Using VR technology, build a giant human cell.

For Members Only reservations, call (617)426-2800 x376. For general information, call (617)423-6758 or (617)426-2800 x310.

FIRST INTERNET AUCTION

Friday, April 22-Friday April 29, 1994

To bid on-line and make history, e-mail: "auction-info@auction.tcm.org" or call (415)323-1909 or (617)426-2800 x322.

THE COMPUTER BOWL® ALL-STAR GAME

Friday, April 29, 1994

Live Event & Party: Doors open at 5:30pm
San Jose (CA) Civic Auditorium

Satellite Broadcast & Party: Doors open at 6:00pm
The Computer Museum

This contest pits the Most Valuable Players from the East and West Coast teams from the past five Computer Bowls against each other to determine who has the ultimate computer smarts. For sponsor and ticket information on both coasts, call (617)426-2800 x399.

COMPUTER ANIMATION FESTIVAL

Friday, July 1-Sunday, July 3, 1994

As part of Boston's annual Harborfest celebration, screen some of the finest computer-generated animation by local and international artists. For information, call (617)423-6758.

HEY, SPORTS FANS!

Support your home team by wearing a limited-edition sports shirt designed exclusively for The Computer Bowl® All-Star Game. Emblazoned with our all-star trading cards and made of 100% cotton, The Computer Bowl Sports Shirts are available through The Computer Museum Store for $9.95. Members get a 10% discount. Sizes come in small, medium, large and extra large. To order, please call the Store at (617)426-2800 x307.

Support The Computer Museum! Members get free admission for one year; The Computer Museum *NEWS*, a newsletter of Museum activities; the *Annual* report; invitations to exhibit previews and members-only events; advance notice of exhibitions and lectures; and a 10% discount on purchases over $5 in the Museum Store. For more information, call the Membership Department at (617)426-2800 x376.

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☐ $60 Two-year	☐ $90 Two-year
☐ $25 One-year student*	Number of family members ______

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Or, charge to my: ☐ Mastercard, ☐ Visa, ☐ American Express.

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